

REMARKS/ARGUMENTS

Favorable reconsideration of the outstanding rejection is respectfully requested.

New Claim 7 has been introduced. Claim 7 differs from Claim 1 primarily in that it recites that the display unit displays details of control by the computerized numerical controller, details of control by the programmable logic controller, **and** details of measurement by the measuring unit. Basis for this can be found at step S73 in Figure 7.

Briefly, the invention is directed to a control system of a machine tool having a computerized numerical controller (CNC) which carries out numerical control of each of a plurality of control axes of the machine tool according to an operation program, a programmable logic controller (PLC) which carries out control of the machine tool according to the operation program, and a measuring unit which measures states of the workpiece under machining by the machine tool. Examples of such control are found in the steps of the non-limiting Figures 2, 4 and 5. According to the invention, a display unit displays details of control by the CNC, details of control by the PLC and details of measurement by the measurement unit. According to the non-limiting embodiment, the details of control by the CNC corresponds to data signals of numerical control processing stored at step S23 in Figure 2; the details of control by the PLC corresponds to data signals of the PLC control processing stored at step S42 and S44 in Figure 4; details of measurement by the measuring unit corresponds to the results of judgment in sizing control processing stored at steps S55 and S56 in Figure 5. Therefore, in the event of trouble such as failure of the machine tool or a machining failure, it is possible for an operator to more efficiently trace the cause of the trouble by simultaneously watching the above details *displayed together on one display unit*.

Claims 1-6 stand rejected under 35 U.S.C. § 102 as being anticipated by U.S. patent 6,138,056 (Hardesty). This rejection, however, is respectfully traversed.

Hardesty is concerned with a system and method for maintenance and repair of CNC machines, which includes a service tracking and assist function. The actual use of a serviceable part is derived from the computer data indicating the movement history of the table. When a value is reached which indicates that service is required, an alarm indication can be displayed related to the component requiring service (column 4, lines 16-29). For example, data indicating that the bearing travel has exceeded a predetermined limit will trigger an alarm indicating a need for bearing lubrication (column 4, lines 30-40). Referring to the embodiment in the reference, the distance that a machine part has traveled in the X-axis is stored in a file  $X_d$ . When the content of file  $X_d$  exceeds a threshold  $d_1$ , the display will indicate that maintenance work is required (step 110 in Figure 2).

The Examiner has alleged that Hardesty discloses, at lines 16-29 of column 4, a display unit displaying at least one selected from details controlled by the computerized numerical controller, details of control by the programmable logic controller, and details of measurement by the measuring unit. However, as explained above, this portion of Hardesty simply describes the display of an alarm when a service interval has been detected. It does not display details of control by the CNC or the PLC, or measurement by a measuring unit. Applicant therefore respectfully submits that the Examiner has failed to establish a *prima facie* case of patentability for Claim 1 or its dependent claims.

New Claim 7 corresponds to Claim 1 except that it recites that the display unit displays details of control of the CNC, details of control of the PLC **and** details of measurement by the measuring unit. As discussed above, this provides the advantage that the workability of the operator of the control system can be improved since it is possible for the operator to carry out examination work by simultaneously watching the above details *displayed together on one display unit*. Hardesty et al. fails to teach or suggest such a display unit, and so Claim 7 clearly defines over this reference.

Claims 2-4 depend from Claim 1 and further recite means for simultaneously sampling details from each of the CNC, the PLC and the measuring unit, and displaying the sampled details. The Examiner alleges that such display is found in the description of Hardesty et al. at locations corresponding to Figures 6 and 9 of the reference. However, Figure 6 simply displays the progress of the tool bit (column 8, lines 38-41), and not details of control according to the CNC, the PLC and details of measurement by a measuring unit. The description at lines 40-67 of column 9 is simply for the display of cycle time for maintenance based upon the amount of use of the machine components. It does not display details of control by the CNC, the PLC and measurement by the measuring unit.

Applicant therefore believes that the present application is in a condition for allowance and respectfully solicits and early Notice of Allowability.

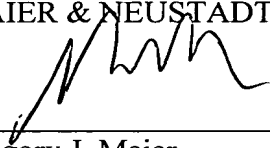
Respectfully submitted,

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